01/24/14 Agenda

- Chapter 6 Retake
    - Remediation Packet is posted on my web site
    - A file with conversion factors has been loaded also
    - You have until Tuesday (1/28) to turn it in.

- Review Homework:
    - Worksheet 1 - The Pythagorean Theorem (finish the back side)
    - Worksheet 2 - 45-45-90 Triangles

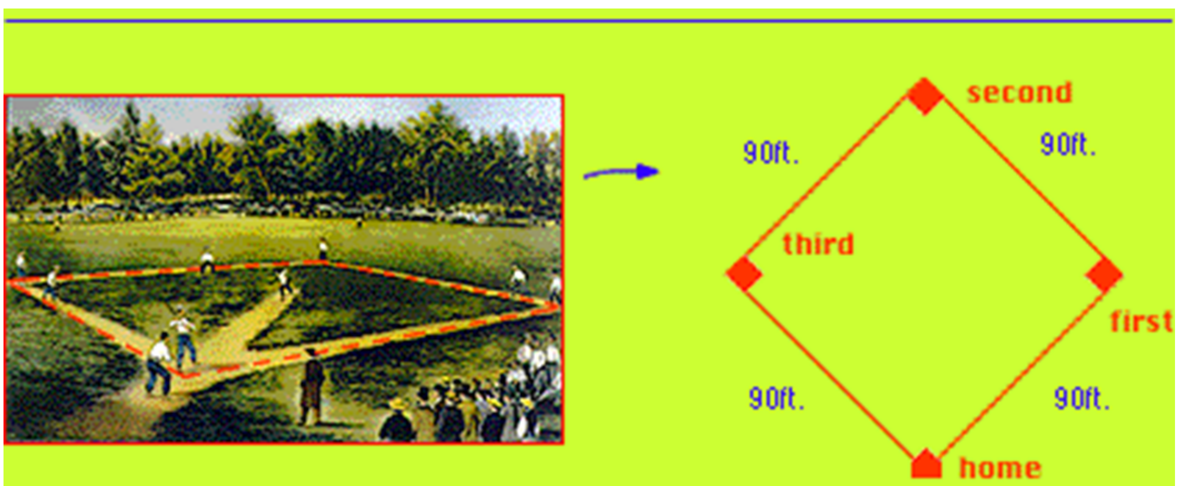
- Section 7.4 - Special Right Triangles
    - Finish 45-45-90 & cover 30-60-90 triangles

- Homework
    - Worksheet 3 - 30-60-90 Triangles

Warm Up - Homework Out!

Baseball:

You've just picked up a ground ball at first base, and you see the other team's player running towards third base. How far do you have to throw the ball to get it from first base to third base, and throw the runner out?



Section 7.4 - Special Right Triangles **Target 7B**

January 24, 2014

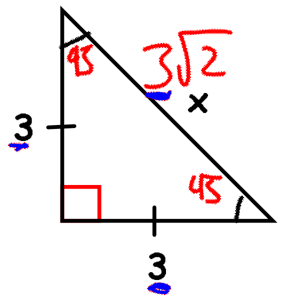
Goal:	Use special right triangles (45-45-90 and 30-60-90) to find the missing side lengths.
Todays Takeaways: **SWBAT**	-- 1. Be able to apply the properties of a 45-45-90 triangle. 1. Be able to apply the properties of a 30-60-90 triangle.

Section 7.4 - Special Right Triangles (45-45-90)

Target 7B

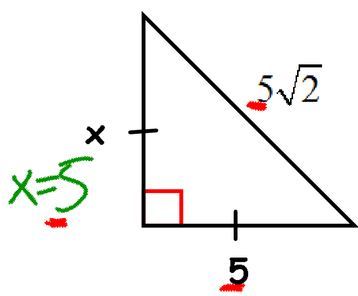
January 24, 2014

Investigation: Find the missing side using the Pythagorean Theorem ($a^2 + b^2 = c^2$)



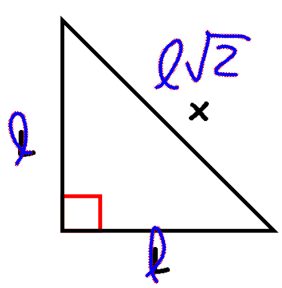
$$3^2+3^2=x^2$$
$$9+9=x^2$$
$$18=x^2$$
$$\sqrt{18}=\sqrt{x^2}$$
$$\sqrt{9\cdot2}=\sqrt{x^2}$$
$$\sqrt{9}\cdot\sqrt{2}=\sqrt{x^2}$$
$$3\sqrt{2}=x$$

1
4
9
16
25
36
49
64
81
100



$$x^2+5^2=(5\sqrt{2})^2$$
$$x^2+\cancel{25}=50$$
$$-\cancel{25}\quad -25$$
$$x^2=25$$
$$x=5$$

$$(5\sqrt{2})^2$$



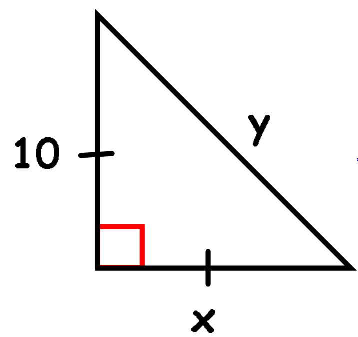
$$\ell^2+\ell^2=x^2$$
$$2\ell^2=x^2$$
$$\sqrt{2\ell^2}=\sqrt{x^2}$$
$$\ell\sqrt{2}=x$$

Conclusion: Any 45-45-90 triangle has the sides of $\ell, \ell, \ell\sqrt{2}$

Section 7.4 - Special Right Triangles (45-45-90)

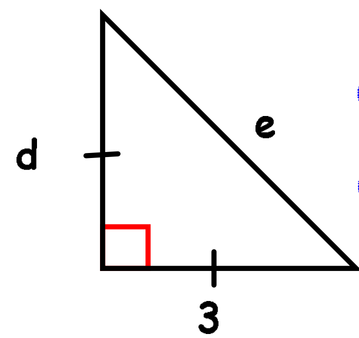
Target 7B

January 24, 2014



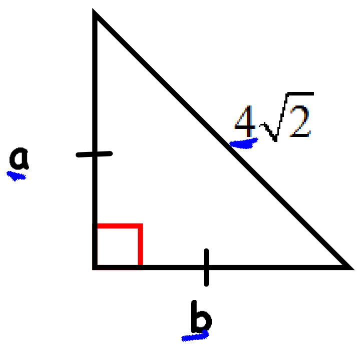
$x = 10$

$y = 10\sqrt{2}$



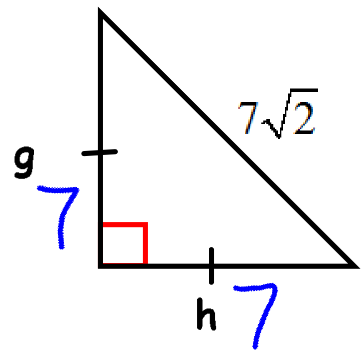
$d = 3$

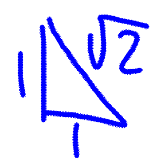
$e = 3\sqrt{2}$

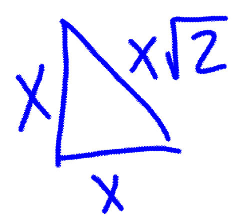


$a = 4$

$b = 4$

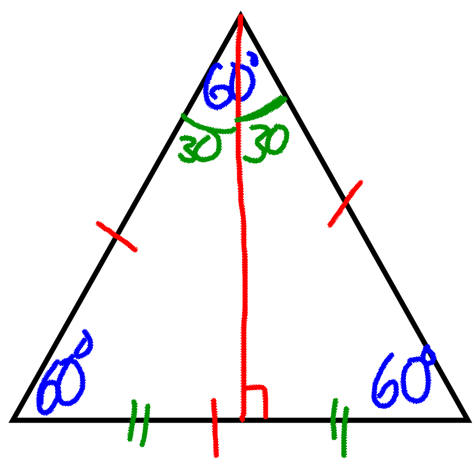






30-60-90 Triangles are a little different. They are still right triangles, but they have 3 different, distinct angles.

Let's start with an Equilateral Triangle where all angles are 60°



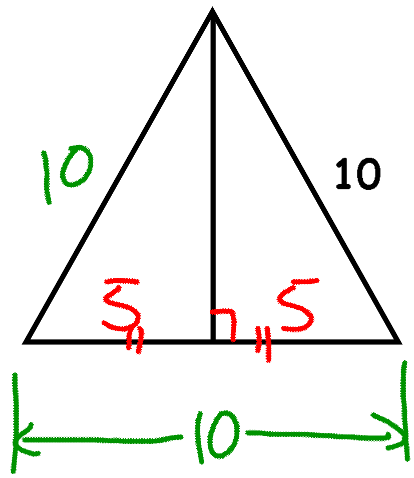
What happens if I draw a median/perpendicular bisector?

Section 7.4 - Special Right Triangles **Target 7B**

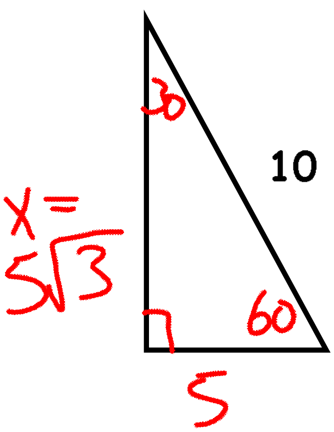
(30-60-90)

January 24, 2014

This is equilateral:



Let's split the triangle and find the rest of the pieces



$a^2+b^2=c^2$

$x^2+5^2=10^2$

$x^2+\cancel{25}=100$

$\quad\;\, -25 \quad\; -25$

$x^2=75$

$\sqrt{x^2}=\sqrt{75}$

$\sqrt{x^2}=\sqrt{25\cdot 3}$

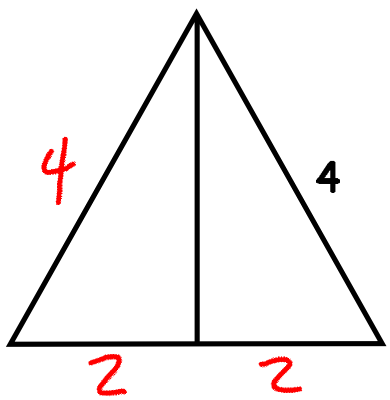
$\sqrt{x^2}=\sqrt{25}\cdot\sqrt{3}$

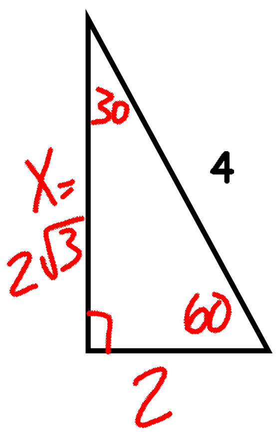
$x=5\sqrt{3}$

Section 7.4 - Special Right Triangles (30-60-90) **Target 7B**

January 24, 2014

Let's find the rest of the pieces:





$$x^2 + 2^2 = 4^2$$

$$x^2 + 4 = 16$$

$$-4 \qquad -4$$

$$x^2 = 12$$

$$\sqrt{x^2} = \sqrt{12}$$

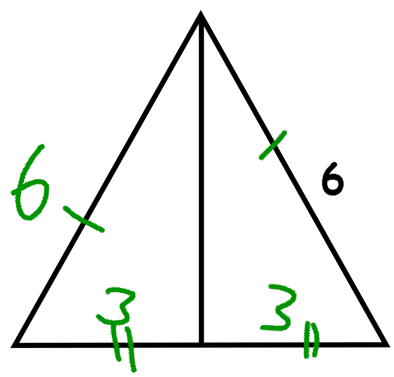
$$\sqrt{x^2} = \sqrt{4 \cdot 3}$$

$$\sqrt{x^2} = \sqrt{4} \cdot \sqrt{3}$$

$$x = 2\sqrt{3}$$

1
4
9
16
25
36
49
64
81
100

Let's find the rest of the pieces:



$$x^2+3^2=6^2$$

$$x^2+9=36$$

$$\underline{-9 \quad -9}$$

$$x^2=27$$

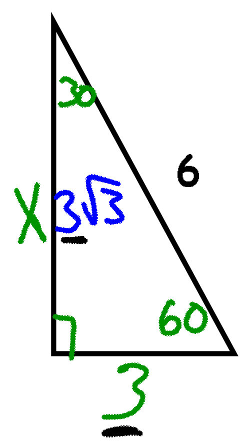
$$\sqrt{x^2}=\sqrt{27}$$

27: 3, 9
9: 3, 3

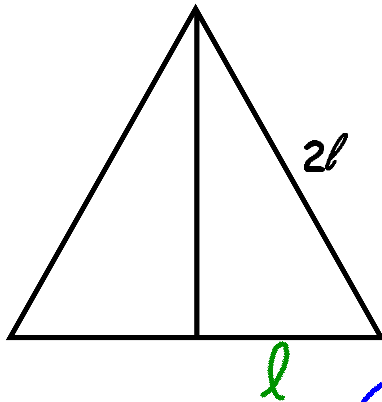
$$\sqrt{x^2}=\sqrt{3\cdot 9}$$

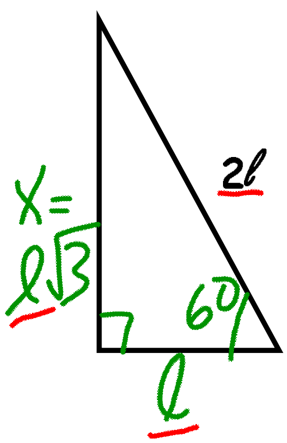
$$x=\sqrt{3}\cdot\sqrt{9}$$

$$x=3\sqrt{3}$$



Let's find the rest of the pieces:





$$x^2+\ell^2=(2\ell)^2$$
$$x^2+\ell^2=4\ell^2$$
$$-\ell^2 \qquad -\ell^2$$
$$x^2=3\ell^2$$

$$\sqrt{x^2}=\sqrt{3\ell^2}$$
$$\sqrt{x^2}=\sqrt{\ell^2}\cdot\sqrt{3}$$
$$x=\ell\sqrt{3}$$

THE SIDE LENGTHS OF A 30-60-90 Δ ARE

$\ell, \ell\sqrt{3}, 2\ell$

Section 7.4 - Special Right Triangles — Target 7B

Summary — January 24, 2014

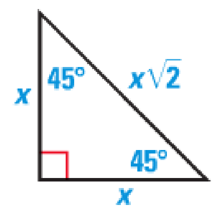
THEOREM — *For Your Notebook*

THEOREM 7.8 45°-45°-90° Triangle Theorem

In a 45°-45°-90° triangle, the hypotenuse is $\sqrt{2}$ times as long as each leg.

hypotenuse = leg $\cdot \sqrt{2}$

Proof: Ex. 30, p. 463



THEOREM — *For Your Notebook*

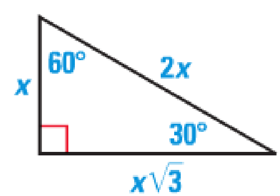
THEOREM 7.9 30°-60°-90° Triangle Theorem

In a 30°-60°-90° triangle, the hypotenuse is twice as long as the shorter leg, and the longer leg is $\sqrt{3}$ times as long as the shorter leg.

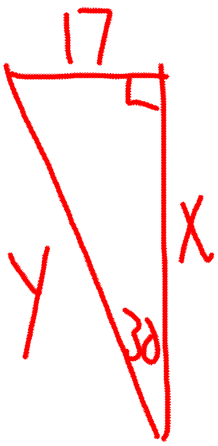
hypotenuse = 2 $\cdot$ shorter leg

longer leg = shorter leg $\cdot \sqrt{3}$

Proof: Ex. 32, p. 463

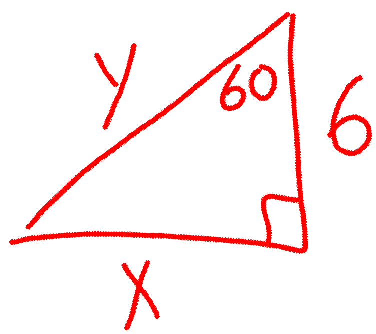


HW
#1



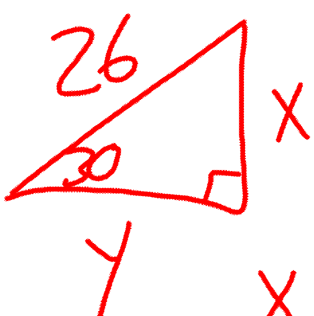
$x = 17\sqrt{3}$

$y = 34$



$x = 6\sqrt{3}$

$y = 12$



$x =$

$y =$